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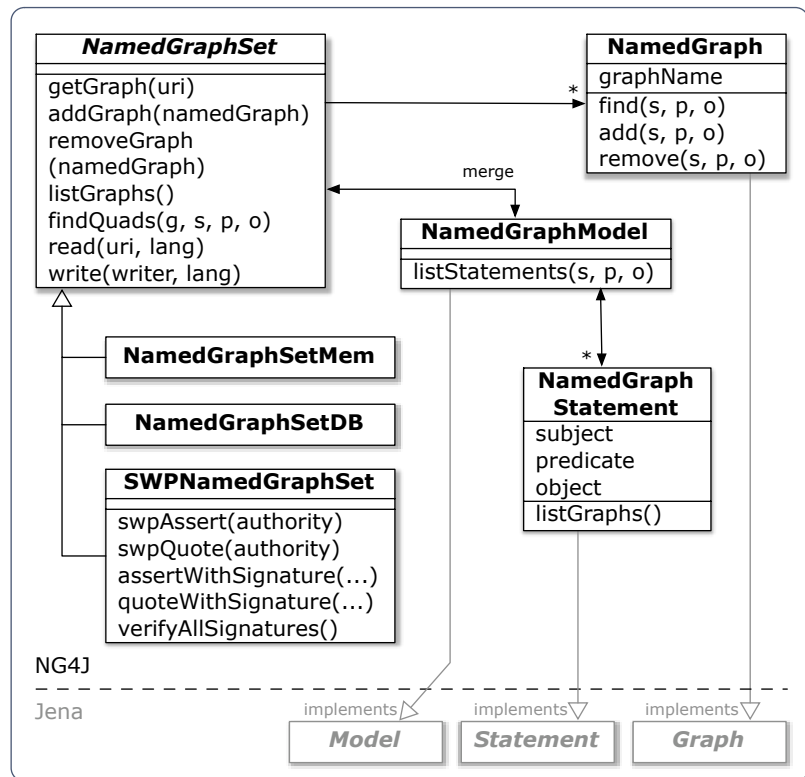
NG4J – Named Graphs API for Jena

Named Graphs

Named Graphs are a simple extension to the RDF abstract syntax and enable statements to be made about RDF graphs. This is beneficial for applications like data syndication, provenance tracking, ontology versioning, signing RDF, and access control to parts of RDF repositories. Named Graphs form the basis for SPARQL, W3C's upcoming RDF query language.

NG4J

The Named Graphs API for Jena is an implementation of Named Graphs on top of the Jena Semantic Web Framework. NG4J extends Jena with:

- graph- and quad-centric methods for manipulating sets of Named Graphs

- Jena Model view on a graphset's merge

- provenance-enabled Jena Statements

- TriQL query language for queries across graphs

- parsers and serializers for the TriG and TriX syntaxes, including support for TriX syntactic extensions with XSLT

- database-persisted graphset storage

- API support for the Semantic Web Publishing (SWP) vocabulary

- creation and verification of graph signatures using X.509 certificates

NamedGraphSet
getGraph(uri)
addGraph(namedGraph)
removeGraph
(namedGraph)
listGraphs()
findQuads(g, s, p, o)
read(uri, lang)
write(writer, lang)

NamedGraph
graphName
find(s, p, o)
add(s, p, o)
remove(s, p, o)

merge

NamedGraphModel
listStatements(s, p, o)

NamedGraphSetMem

NamedGraphSetDB

SWPNamedGraphSet
swpAssert(authority)
swpQuote(authority)
assertWithSignature(...)
quoteWithSignature(...)
verifyAllSignatures()

NamedGraph Statement
subject
predicate
object
listGraphs()

NG4J

Jena

implements *Model*

implements *Statement*

implements *Graph*

TriG

A serialization format for sets of Named Graphs, based on Turtle

```
@prefix swp: <http://www.w3.org/…/swp-2/>.
@prefix foaf: <http://xmlns.com/foaf/0.1/>.
@prefix : <http://example.org/>.

:G1 {
  :Bob foaf:mbox <mailto:bob@example.org>.
}
:G2 {
  :Bob foaf:mbox <mailto:bob2@example.com>.
}
:warrant {
  :warrant a swp:Warrant.
  :warrant swp:authority :Alice.
  :warrant swp:signatureMethod
    swp:JjcRdfC14N-rsa-sha1.
  :warrant swp:signature
    "E2aylV…"^^xsd:base64Binary.
  :warrant swp:assertedBy :warrant.
  :G1 swp:assertedBy :warrant.
  :G1 swp:digestMethod swp:JjcRdfC14N-sha1.
  :G1 swp:digest "YjRhNz…"^^xsd:base64Binary.
  :G2 swp:quotedBy :warrant.
  :G2 swp:digestMethod swp:JjcRdfC14N-sha1.
  :G2 swp:digest "NmM2NW…"^^xsd:base64Binary.
}
```

TriX

A serialization format for RDF and sets of Named Graphs that plays well with XML tools. An XSLT-based extension mechanism can be used to define more concise variations of the syntax.

```
<TriX xmlns=
  "http://www.w3.org/2004/03/trix/trix-1/">
  <graph>
    <uri>http://example.org/graph1</uri>
    <triple>
      <uri>http://example.org/aBook</uri>
      <uri>http://example.org/title</uri>
      <plainLiteral>A Good Book</plainLiteral>
    </triple>
  </graph>
  <graph>
    <uri>http://example.org/graph2</uri>
    <triple>
      <uri>http://example.org/graph1</uri>
      <uri>http://example.org/source</uri>
      <uri>http://example.org/books.rdf</uri>
    </triple>
  </graph>
</TriX>
```

TriQL

A language for queries across Named Graphs, based on RDQL. The example fetches all email addresses of Bob that have been asserted by Alice in 2005, with the respective graph names.
In NG4J, TriQL queries are executed against instances of the NamedGraphSet class.

```
SELECT ?email, ?source
  WHERE ?source (ex:Bob foaf:mbox ?email)
        ?warrant (
          ?source swp:assertedBy ?warrant.
          ?warrant swp:authority :Alice.
          ?warrant dc:date ?date)
    AND ?date >= "2005-01-01"^^xsd:date
    AND ?date < "2006-01-01"^^xsd:date
  USING
  ex FOR <http://example.org/>
foaf FOR <http://xmlns.com/foaf/0.1/>
 swp FOR <http://www.w3.org/…/swp-2/>
  dc FOR <http://purl.org/dc/elements/1.1/>
```

Further information about NG4J and download: http://www.wiwiss.fu-berlin.de/suhl/bizer/ng4j/